

HP Portability: RAM/ROM vs. Disk-Based Approach
Hal Goldstein
Personalized Software
Fairfield, Iowa 52556

I am the publisher and editor of The Portable Paper, a bi-monthly magazine devoted exclusively to Hewlett-Packard (HP) Portable computers. We review products that run on the Portables and provide in-depth tutorials, tips, and tricks on how to make best use of HP Portables. Our company, Personalized Software also sells many software and hardware products that enhance HP Portables.

We know from our extensive customer service how people use and feel about HP Portables. We are intimately familiar with the machines' strengths and weaknesses. From this vantage point, we will compare the two main versions of computer "portability" in the marketplace today: the RAM/ROM disk-based portable and the mechanical disk drive portable. In particular, we will compare the Portable Plus/HP110 with the new HP Portable Vectra.

First we'll look at how HP RAM/ROM portables work, at their advantages and disadvantages, and recent advancements. Then we'll look at how the mechanical disk drive portables work and their advantages and disadvantages.

RAM/ROM MACHINES

To understand what we mean by a RAM/ROM electronic disk-based portable, we will examine the Hewlett-Packard Portable Plus and the HP110. Both these machines contain two electronic "pseudo" disks: a RAM-based A drive disk and a ROM-based B drive disk. These two disks are not physical disks in the usual sense -- they are electronic simulations of disks. From both the user's and the the operating system's point of view these RAM and ROM disks look the same as a floppy or hard disk.

The RAM-based A drive disk stores data and programs that can be created, modified, or deleted, in the same way one would manipulate data on a floppy or hard disk. Similarly, the ROM-based B drive disk functions like a write-protected disk. A user can access any data or program on the ROM disk. However, no information cannot be added to, deleted from, or modified on the ROM disk.

Computer users may be familiar with "RAM disks." Usually, these can be created by software and function as a disk as long as the computer is on. In contrast the HP Portable electronic disks are "non-volatile" RAM. Unlike volatile RAM, the electronic disk stores and maintains files and programs even after the computer is "turned off." The internal battery supplies enough power to keep these files and programs alive for weeks and even

months.

Further, this non-volatile RAM in the HP110 and Portable Plus actually serves two functions. The user divides his RAM between internal memory and an electronic disk according to his requirements. For example, on the 512K Plus, a user can allot 128K to internal memory and 384K to the electronic disk drive. That means he has 128K for program and temporary data space. When he wants to save his work, he saves it to the permanent 384K electronic A disk space. The B disk stores ROM software programs or data and is never used directly to save files.

We will now examine the HP110 and Portable Plus more closely.

THE HP110

The first HP RAM/ROM portable, the HP110, emerged from one simple idea: to create a lightweight, powerful, rugged portable computer that meets 95 percent of a portable computer user's needs.

Built into the ROM B disk of the HP110 is the full implementation of Lotus 1A, an easy-to-use word-processor called MemoMaker, communications software for the 300 baud modem, and MS-DOS 2.11. It also has 272K bytes of non-volatile RAM for electronic disk storage and internal memory.

The default and most common division of that 272K of RAM between internal memory and electronic disk is 96K internal memory and 176K RAM disk. With this configuration an HP110 can hold, for example, on its electronic disk: Turbo Pascal, a text formatting program, 110K for data files -- and still have enough internal memory to run many Lotus applications.

HP no longer makes this 16-line HP110. (However, Personalized Software and other sources sell used HP110's for between \$700 and \$1000, the bargain of the year.)

The HP110 does have its limitations. Some users want a bigger screen, larger memory, and IBM compatibility. They also want a choice of ROM applications and a higher-speed modem. To satisfy these desires, Hewlett-Packard created the Portable Plus.

THE PORTABLE PLUS

The Portable Plus' 25-line screen, greater memory capacity, user configurable ROM drawer, and 300/1200 baud modem make it more powerful than the HP110. It is more IBM compatible than the HP110, although it is not a true compatible.

The nine-pound Portable Plus comes with a standard 512K of internal memory. Until recently, the memory could only be expanded by 384K of RAM, but now it can be expanded to as much as

4.5 Megabytes (4500K). The standard Plus sells for \$2195 (or \$2700 with an internal 1200 baud modem).

Users may then purchase one or two additional drawers, depending on their own requirements. One drawer, usually reserved for ROM software, costs \$160 plus the price of the ROM software (e.g., Lotus, \$495). There are twelve sockets in the ROM drawer -- room for 8 to 15 applications. The other drawer is usually reserved for additional RAM. This flexibility permits users to build their own system by purchasing ROM chips and disk-based software for the electronic RAM disk.

Recent developments have not just enhanced the Portable Plus, they have made it a brand new machine. The \$995 HP 1 megabyte RAM drawer as well as the Personalized Software/SoftWord 2 megabyte drawer and 1 megabyte RAM/8-socket ROM drawer greatly expand the computer's memory and capability.

These larger RAM drawers allow full-blown RAM software packages such as WordPerfect (word processor), Condor 3 (relational data base manager), and T/Master (spreadsheet, word-processor, communications, graphics, database), to fit in the Plus' RAM.

RAM/ROM ADVANTAGES

What are the advantages to RAM/ROM disk-based portables? First of all, they are rugged. Since there are no moving parts other than the keys, the portables can be dropped without damaging the unit.

Second, the electronic loading makes input and output fast. For example, it takes only a few seconds to load Lotus from ROM. Third, with built-in disks, users don't have to carry disks on the road or worry about copy protection (e.g., Lotus). Greater memory capacity means users can pack more in less space at lower cost.

Perhaps most importantly, the briefcase size and nine-pound weight make these computers truly portable.

ROM software comes in small chips that can be easily inserted into the Portable Plus. RAM software comes on 3 1/2" or 5 1/4" disks that can be run or transferred onto the electronic RAM disk from an external HP9114 disk drive or an IBM PC.

RAM/ROM DISADVANTAGES

One disadvantage to RAM/ROM portables is the separate disk drive required for loading, storing, and backing up files and for making room on the electronic disk. The external disk drive, which makes use of the HP-IL interface protocol, provides slow access.

0041- 3

HP Portability: RAM/ROM vs. Disk-Based Approach

The Portable Plus is not a true IBM compatible and, even with recent price reductions, is still fairly expensive. However, it certainly should be possible to create an IBM compatible RAM/ROM machine. As memory prices fall, it should be possible to create a less expensive machine.

MECHANICAL DISK DRIVE BASED COMPUTERS

Unlike a RAM/ROM disk drive, a mechanical disk drive magnetically stores information on a flexible disk (or some other medium). While a motor spins the disk, a delicate, electronic device moves in very close to read the disk and write on it. These moving parts make the computer susceptible to damage if dropped. They also significantly increase the computer's weight.

ENTER THE PORTABLE VECTRA

The new Vectra CS computers (the dual floppy Portable Vectra CS and the hard disk Portable Vectra CS Model 20) function as both portable and desktop computers. And they are true IBM compatible computers!

The 17.6-pound, briefcase-size Vectra offers four internal I/O expansion slots for adding expanded memory, serial ports, a 2400-baud modem, and other devices, without increasing the computer's size. The Portable Vectra comes standard with an expansion card that takes up one of the I/O slots and that contains a parallel centronix port and a monitor interface. That means the Portable Vectra can be easily connected to a printer and a monochrome, CGA, or EGA color monitor.

Other features include: a large, 12-inch, liquid crystal display based on new "supertwist" technology; a full-size keypad with 12 function keys; a 1.44-Megabyte (1440K), 3 1/2 " flexible disk drive capacity; and a standard 640 Kbytes of user memory.

Users can also add up to six Megabytes of EMS RAM to the dual floppy Vectra and up to four Megabytes to the 20 Megabyte hard disk Portable Vectra Model using the I/O expansion slots. The NEC V30 CPU speed is twice as fast as the HP110, the Portable Plus, or the IBM XT. For certain applications it runs as fast or faster than an IBM AT.

The basic Vectra, with its dual-floppy system costs \$2495. The Vectra Model 20, with its 20 Megabyte system, is a little heavier than the basic unit and costs \$3595.

MECHANICAL DISK DRIVE DISADVANTAGES

Despite a clamshell, closed-case design and extra shock mounting

0041- 4

HP Portability: RAM/ROM vs. Disk-Based Approach

for its mechanical disk drive, the Vectra is not as sturdy as a RAM/ROM computer and its electronic disk drive.

It is less convenient than the HP110 and Portable Plus; it is twice as heavy, requires disks, and, although its central processor (CPU) is faster, its input and output is much slower.

SUMMARY COMPARISON CHART OF TWO APPROACHES

The first section of the following chart compares the RAM/ROM vs. mechanical disk drive approach to portable computing given the state of today's technology and costs. The second section compares the Portable Plus to the Portable Vectra in particular. The differences in the second section reflect design decisions rather than characteristics inherent in RAM/ROM or mechanical disk drive machines.

Characteristic	Electronic Disk Drives	Mechanical Disk Drives
Ruggedness	More	Less
I/O (Save/Retrieve)	Faster	Slower
Weight	Lighter	Heavier
Run off battery	Longer	Shorter
Backup	Harder	Easier
Storage capacity	Less	More
Cost	More	Less
Self-containment:		
Short trips	More	Less
Long trips	Less	More
Portable Plus Vs. Portable Vectra:		
Keyboard	Inferior	Superior
Screen	Smaller	Larger
IBM Compatibility	Some	Complete
Expandability	2 RAM or ROM drawers	4 Adapter slots
CPU	Slower	Faster
Internal memory	512K Max	4 Meg with EMS'g

CONCLUSION

The marketplace has not yet caught on to the true convenience and portability of RAM/ROM-based computers. Rather, most users still view the ideal portable as a scaled-down version of their desktop machines, mechanical disk drives and all. The more a portable resembles a desktop, the better the portable.

Given this criteria, the new HP Portable Vectra succeeds admirably. In fact, its ability to hold expansion cards, its full keyboard, and its 1.44 Megabyte floppy capacity make it unique. If an external monitor is attached to the Portable Vectra, the Portable Vectra is virtually indistinguishable from a desktop computer. When portability is required, it takes only seconds to detach the monitor and snap on the LCD screen.

However, for people who travel a lot and really need portability, RAM/ROM machines are the way to go. Mechanical disk drive-based portables can never match the light weight, ruggedness, and long battery life of RAM/ROM machines. Hopefully, HP will take the best of the two technologies to produce an IBM Compatible RAM/ROM computer with detachable mechanical disk drives.

With its Portable Plus and Portable Vectra, HP has created two exceptional machines. Unfortunately, although HP has invested millions of dollars in research and development funds to create these computers, it has not been willing to spend the money to educate the marketplace as to the practical value of the two machines.

Both computers look different from the "typical" portable in the market. Consequently, neither of the computers has been especially well-received in the computer press or at the retail computer dealer level.

Many traveling professionals will find that a 1.5 Megabyte Portable Plus with Lotus, a word processor, spelling checker, and communications package all in ROM is the most useful, practical powerful portable computer in the marketplace. On the other hand the Portable Vectra with an external monitor is both a full-featured desktop and a portable computer. It is ideal for the executive who wants a powerful, ergonomic, full-featured, compact IBM compatible computer for his office that he can easily take home at night.

My strong hope is that HP will not throw away its leadership role in the Portable industry by abandoning its ROM and RAM disk-based technology. Whether or not HP stays in this RAM/ROM arena, you can be sure that, eventually, other Portable manufacturers will pick up the idea and produce IBM PC-compatible RAM- and ROM-based machines. It is just too good of an approach to Portable computing not to catch on in the general marketplace.

